SOFTWARE ENGINEERING
(Common to CSE & IT)

Course Code :13CT1119

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Course Educational Objectives:

The main objective of the course is to give an overall idea about the software development process.

- To Analyze, Design, Test and Maintain Software Systems.
- To develop Software Using good Quality Concepts.
- Use Cost Estimation Techniques to estimate the cost of the software
- To avoid risks by using Risk Management Techniques.
- Understands various project , process and product metrics.

Course Outcomes:

At the end of the course the student should be able to

- Analyze and Design Software Systems.
- Test and MaintainSoftware Systems.
- Develop Software Using good Quality Concepts.
- Understand the risk management.
- Use Cost Estimation Techniques to estimate the cost of the software and avoid risks by using Risk Management Techniques.

UNIT-I (12 Lectures)

INTRODUCTION TO SOFTWARE ENGINEERING:

Software, The Nature of Software, Software Engineering, The Software Process, Software Engineering practice, Software Myths, A Generic Process Model, Process Assessment and Improvement, Product and Process, CMMI. (Text Book-1)

PROCESS MODELS:

Prescriptive Process Models- The Waterfall Model, Incremental Process

Models, Evolutionary Process Models, Concurrent Models. Specialized Process Models.The Unified Process, Personal and Team Process Models.(Text Book-1)

UNIT-II (12 Lectures)

SOFTWARE REQUIREMENTS:

Functional and Non-functional Requirements, User Requirements, Interface Specification, the Software requirements document.

REQUIREMENTS ENGINEERING PROCESS:

Feasibility Studies, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management. (Text Book-2)

UNIT-III (12 Lectures)

DESIGN ENGINEERING:

The Design Process, Design Concepts, the Design Model.

ARCHITECTURAL DESIGN:

Software Architecture, Architectural Genres, Architectural Styles, Architectural Design, Architectural Mapping using Data Flow. (Text Book-1)

SYSTEM MODELS:

Context Models, Behavioral Models, Data Models, Object Models, Structured Methods.

OBJECT ORIENTED DESIGN:

Objects and Object Classes, an Object Oriented Design Process, Design Evolution. (Text Book-2)

UNIT-IV (12 Lectures)

USER-INTERFACE DESIGN:

The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

SOFTWARE TESTING STRATEGIES:

A Strategic Approach to Software Testing, Test Strategies for Conventional Software and Object Oriented Software, Validation Testing, White- Box Testing, Basis Path Testing, Black-Box Testing, System Testing. (Text Book-1)

PRODUCT METRICS:

A Framework for Product Metrics, Metrics for Requirements Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

PROCESS AND PROJECT METRICS:

Software Measurement, Metrics for Software Quality. (Text Book-1)

UNIT-V (12 Lectures)

RISK MANAGEMENT:

Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM Plan.

QUALITY MANAGEMENT:

Software Quality, Informal Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, the ISO 9000 Quality Standards. (Text Book-1)

TEXT BOOKS:

1. Roger S. Pressman, *"Software Engineering- A Practitioner's Approach"*, 6thEdition , TMH, 2010.
2. Sommerville, *"Software Engineering"*, 9th Edition, Pearson Education, 2011.

REFERENCES:

1. K.K.Agarwal & Yogesh Singh, *"Software Engineering"*, 3rd Edition, New Age International Publishers, 2008.
2. Shely Cashman Rosenblatt, *"System Analysis and Design"*, 2nd Edition, Thomson Publications, 2011.
3. PankajJalote, *"An Integrated Approach to Software Engineering"*, 3rd Edition, Narosa Publishing House, 2011.

WEB REFERENCES:

1. http://nptel.iitm.ac.in/courses/106101061/
2. http://nptel.iitm.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Soft%20Engg/New_index1.html